National Institute of Environmental Health Sciences

Spatial and temporal variability of fecal indicator bacteria in an urban stream under different meteorological regimes

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Abstract:

As a representative urban stream in Korea, the Gwangju (GJ) stream suffers from chronic fecal contamination. In this study, to characterize levels of fecal pollution in the GJ stream, the monthly monitoring data for seven years (from 2001 to 2007) and the hourly monitoring data from two field experiments were examined with respect to seasonal/daily variations and spatial distribution under wet and dry weather conditions. This research revealed that concentrations of fecal indicator bacteria strongly varied depending on the prevalent meteorological conditions. That is, during the dry daytime, fecal indicator bacteria concentrations decreased due to inactivation from solar irradiation, but rapidly increased in the absence of sunlight, suggesting external source inputs. In addition, bacterial concentrations substantially increased during rainfall events, due probably to a major contribution from combined sewer overflow. The observations in this study can be useful for implementing fecal pollution management strategies and for predicting fecal contamination as a function of meteorological conditions.

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Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Extreme Weather Event, Food/Water Quality

Extreme Weather Event: Flooding

Food/Water Quality: Pathogen

Geographic Feature:

resource focuses on specific type of geography

Freshwater, Urban

Geographic Location:

resource focuses on specific location

Non-United States

Non-United States: Asia

Asian Region/Country: Other Asian Country

Other Asian Country: Korea

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Infectious Disease

Infectious Disease: Foodborne/Waterborne Disease

Foodborne/Waterborne Disease (other): fecal indicator bacteria

Resource Type: ☑

format or standard characteristic of resource

Research Article

Timescale: ☑

time period studied

Time Scale Unspecified

Vulnerability/Impact Assessment: ☑

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content